



# **Intelligent Integration of Information (I\*3) and BAA 97-09**

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DARPA/ISO

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# BAA 97-09 - Collaboration, Visualization, and Information Management (CIVM) Technology

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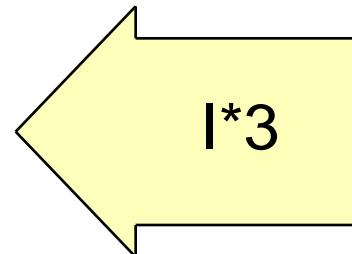


## ■ Collaboration and Visualization

- Tools for Sharing Meaning
- Tools for Sharing Views

## ■ Information Management

- Analysis Environments
- Interoperable Repositories
- CIVM Testbed



# Intelligent Integration of Information (I\*3) Program Goals

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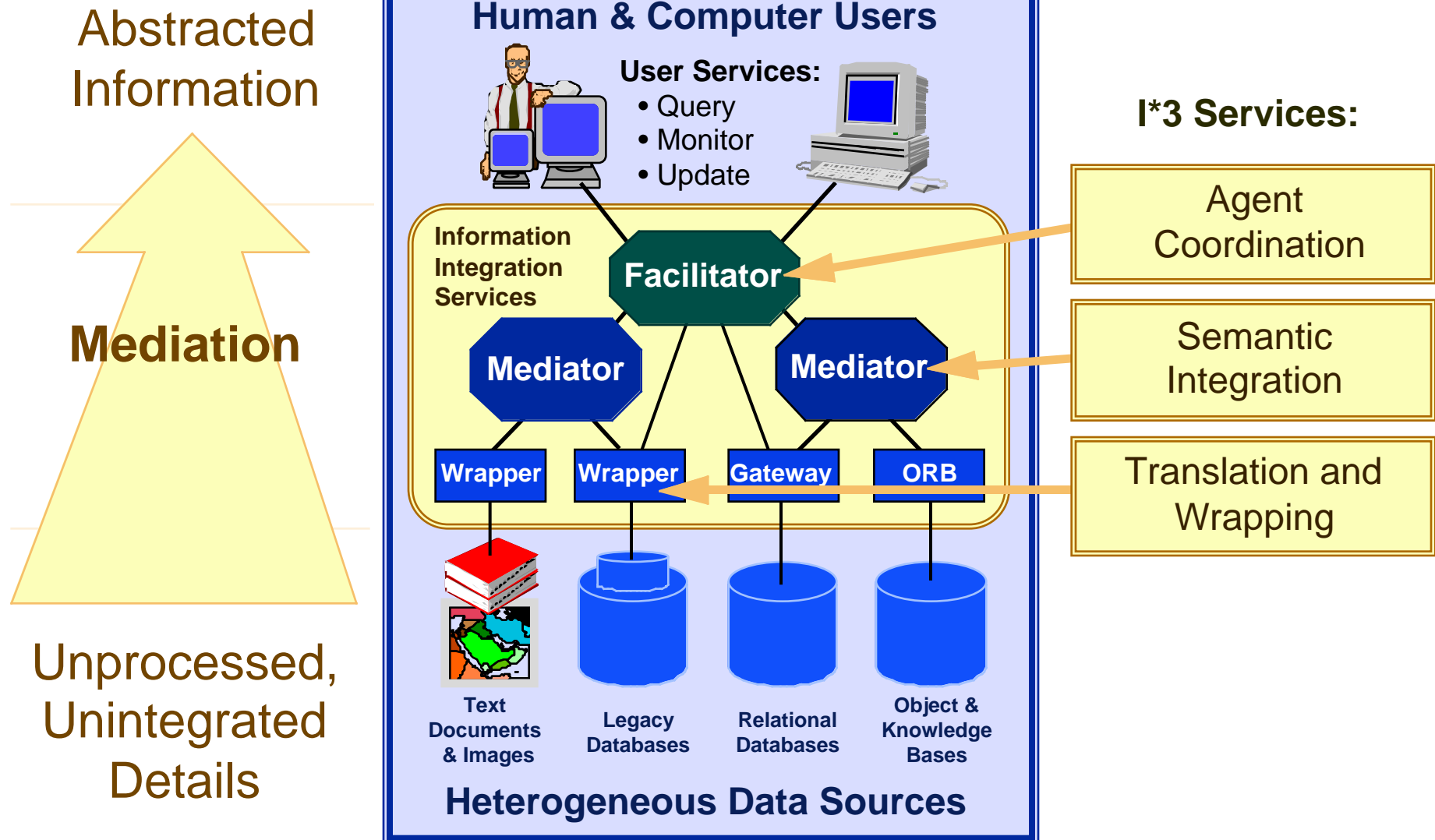


I\*3 includes the definition, development, demonstration, and application of new technology to enable the intelligent discovery, retrieval, filtering, correlation, integration, and abstraction of information from large collections (i.e., 100's) of dynamically changing, potentially inconsistent, heterogeneous data sources, including knowledge bases, structured databases (hierarchical, network, relational, and object-oriented), semi-structured documents (e.g., web pages), and unstructured text, image, and video files.

The goals of the I\*3 program are to:

- (1) develop information integration technology to enable a new level of capability for human and computer users to semantically search, query, monitor, and update large collections of heterogeneous data sources; and
- (2) develop, demonstrate, and transition a suite of information integration tools which reduce the cost of developing, maintaining, and evolving these large-scale integrated systems.

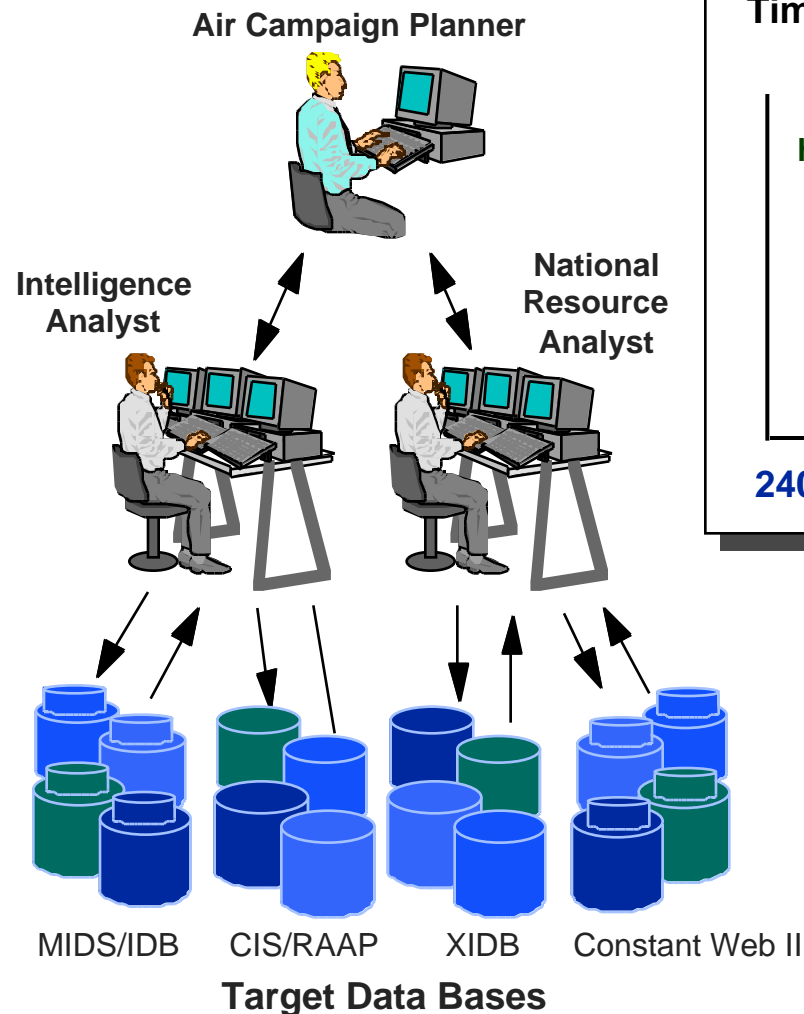
# Intelligent Integration of Information (I\*3) Approach to Integration



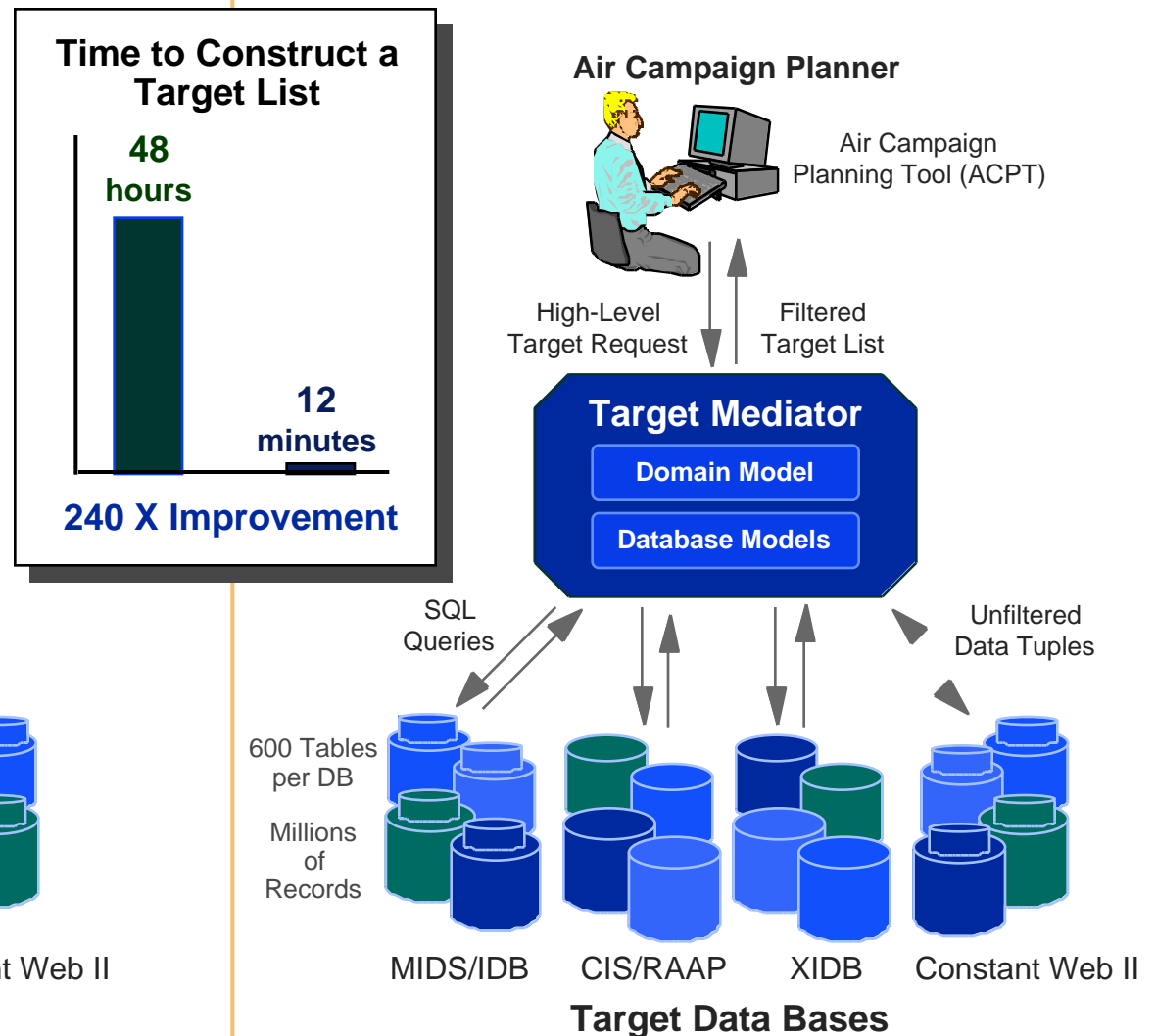
# Intelligent Integration of Information (I\*3) Database Mediator for Air Campaign Planning



## Without Mediation



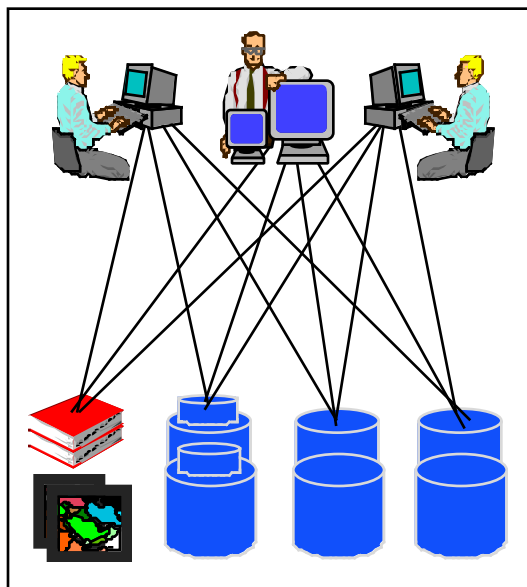
## With Mediation



# Intelligent Integration of Information (I\*3) Integration Architectures

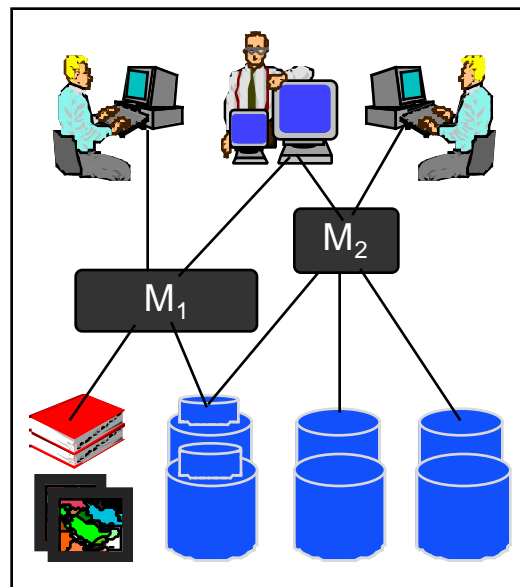


## Point-to-Point



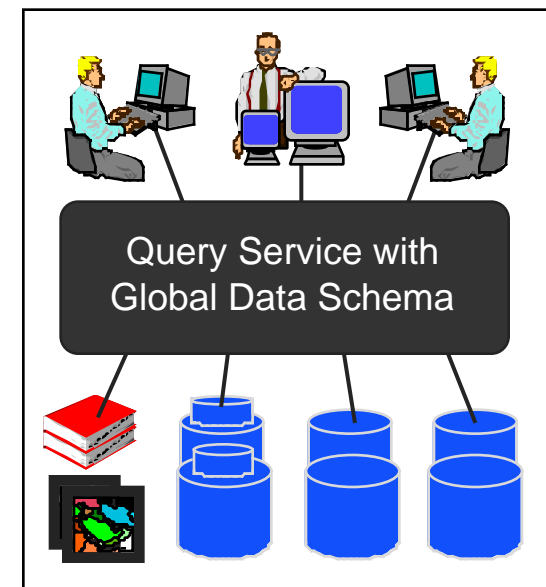
One "Integration"  
Module per  
Application

## Mediated



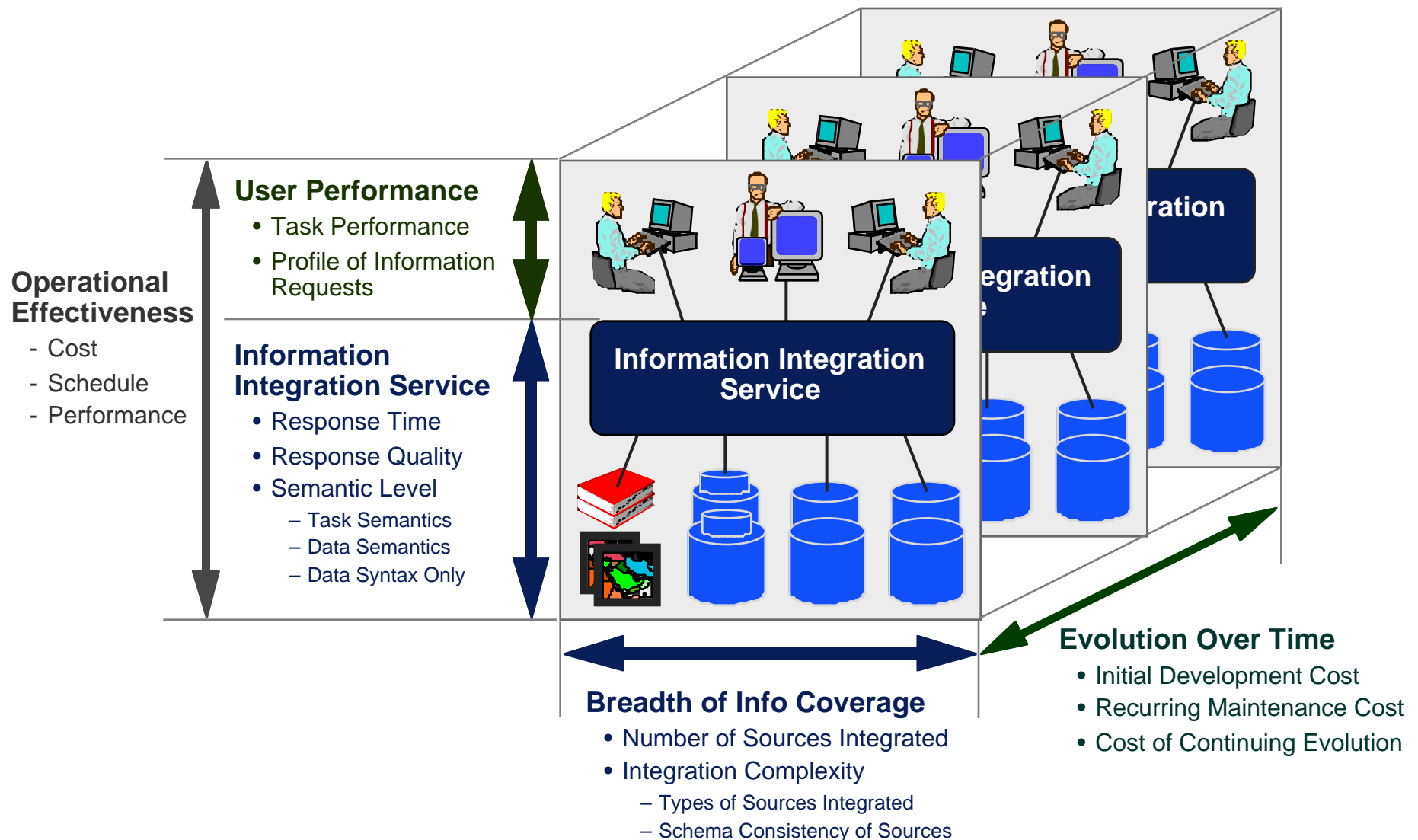
One Mediation  
Module per Domain

## Fully Integrated



One Global  
Integration Module

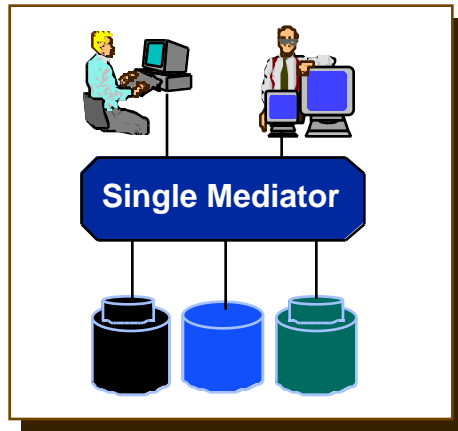
# Intelligent Integration of Information (I<sup>3</sup>) Dimensions and Parameters



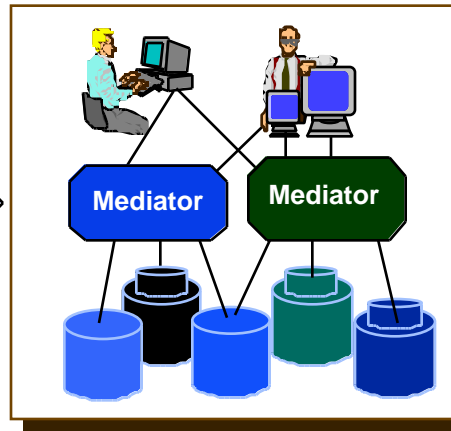
# Intelligent Integration of Information (I\*3) Program Goals



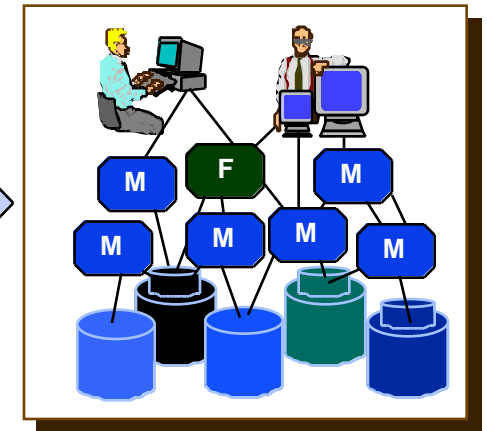
1995



1997



1999



- **Single-Mediator Systems**
  - 1-10 Data Sources
  - Hand-Crafted Mediators
  - Cost = 2-4 Hours per Entity
  - Structured Databases
  - Performance Improvement



Air Campaign Planning  
Battlefield Trauma Care  
F-22 IWSDB

- **Multiple-Mediator Systems**
  - 10-40 Data Sources
  - Mediator/Wrapper Toolkits
  - Cost < 1 Hour per Entity
  - Unstructured Data Sources
  - Info Security (with ITO)



Battlefield Awareness  
JTF C2 & Planning  
Advanced Logistics Program

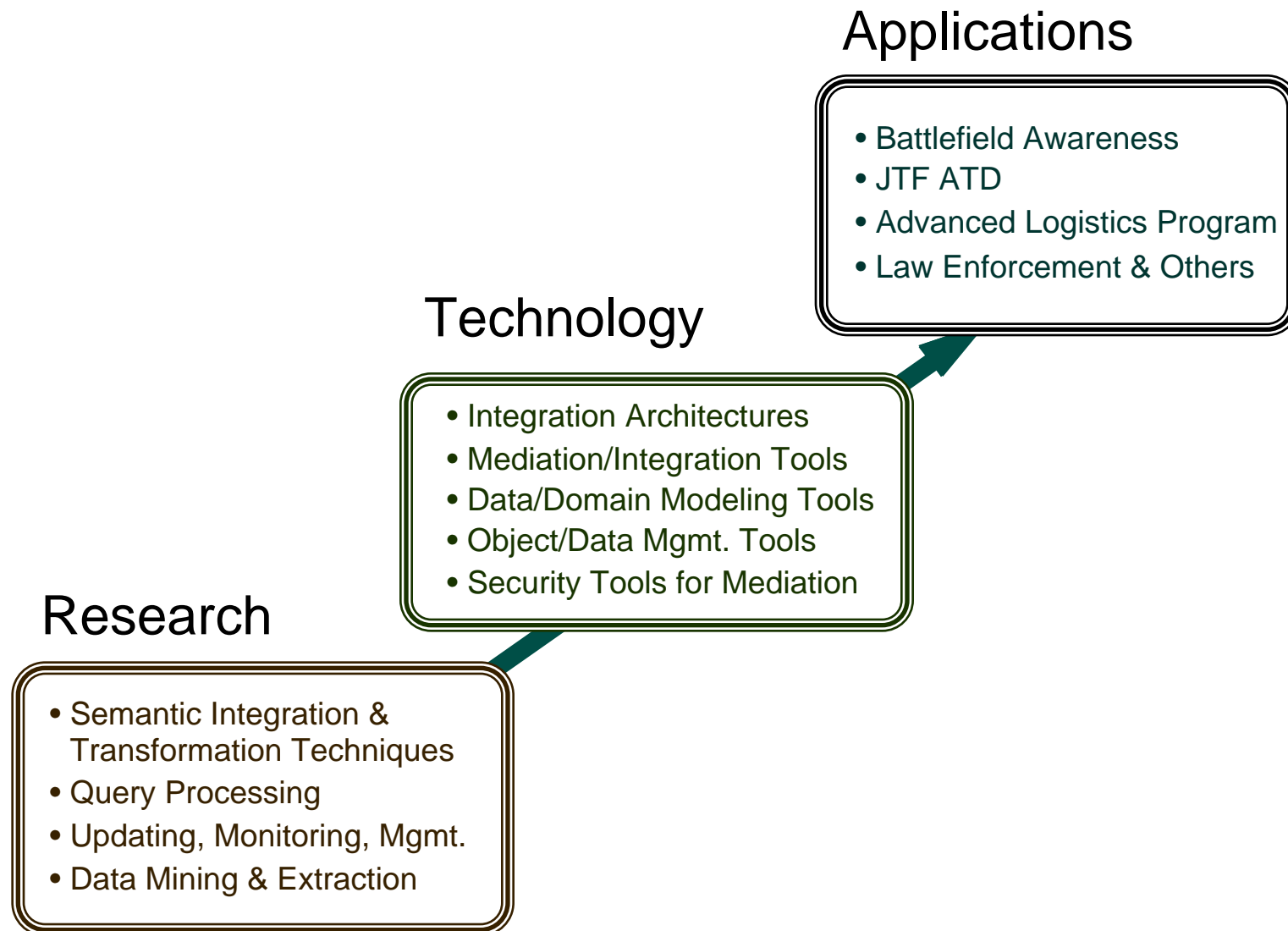
- **Information Associates**
  - > 50 Data Sources
  - Automatic Construction
  - Cost < 20 min per entity
  - Inconsistent Data Sources
  - NL & HCI Integration



Battlefield Awareness  
Intelligence Analysis  
Crisis/Battlefield Management



# Intelligent Integration of Information (I\*3) Applications Focus



# Intelligent Integration of Information (I\*3)

## I\*3 Areas of Interest for BAA 97-09

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### ■ I\*3 Technology

- Basic Mediation Technology
- Unstructured Data (Web Pages, Text, Images)
- Inconsistent and Errorful Data
- Active Mediation & Data Management
- Automatic inspection and characterization of data sources

### ■ Integration and Application of I\*3 Technology

- Integration Architecture and Integration Platform
- Ruggedization and Inclusion of I\*3 Technology
- Complete Development Environment
- Test Data
- Application to DARPA and DoD Information Systems
- Commercialization